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AUTHOR Schwartz, Arthur H.
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ABSTRACT

The Technology Enhanced Accent Modification (TEAM) project created multimedia software to improve the oral proficiency of international teaching assistants (ITAs). Objectives were to: (1) develop reliable accent modification software that would operate on computers found at most colleges; (2) determine how TEAM-based accent modification instruction impacted on the performance of students taught by ITAs; and (3) disseminate the software to institutions with the largest numbers of ITAs. The multimedia materials consist of software that enables the user to retrieve, display, and play model utterances; a criterion-referenced accent survey; a curriculum that addresses the 15 features of speech that make accents most difficult to understand; an instructional methodology to teach ITAs how to monitor and modify their accents; a database of 3600 utterances (1800 male and 1800 female); and a reference manual describing program operation. The project was field tested using 128 teaching assistants at three universities. TEAM evaluation results indicate that students are more satisfied with their instruction by ITAs, and ITAs perform better on objective measures of oral proficiency. Appendices include demographic information on teaching assistants, ratings of teaching assistant speech patterns, and publicity materials. (SW)

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Project Title: Technology Enhanced Accent Modification(TEAM) for International Teaching Assistants (ITAs)

ED 414 836

Cover Sheet

Grantee Institution

Cleveland State University
Department of Speech and Hearing (MC430)
Cleveland, OH 44115

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Project Director:

Arthur H. Schwartz, Ph.D.
Professor, Speech and Hearing
Cleveland State University (MC418A)
Cleveland, OH 44115
(216) 687-6990
A.Schwartz@CSUOHIO.EDU

FIPSE Program Officer: Eulalia B. Cobb

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PROJECT SUMMARY

The TEAM (Technology Enhanced Accent Modification) Project has developed, tested, and evaluated multimedia software designed to improve the oral proficiency of International Teaching Assistants(ITAs). The multimedia consists of: (1) software; (2) an criterion referenced accent survey; (3) a curriculum; (4) an instructional methodology; (5) a database model utterances; and (6) a reference manual. The project was field tested at three different universities with 128 teaching assistants. Results of evaluations indicate students enrolled in classes taught by ITAs who have received TEAM perform better and are more satisfied with their instruction. Results also indicate ITAs taught with the TEAM approach perform better on objective measures of oral proficiency. This study demonstrates that it is possible to develop effective multimedia that operates on common personal computers, thereby making accent modification instruction more accessible to the more than 100,000 international teaching assistants teaching many of the 13-14,000,000 students enrolled at the 3,600 U.S. colleges and universities.

Project Director: Arthur H. Schwartz, Ph.D.
Professor, Department of Speech and Hearing
Cleveland State University
Cleveland, OH 44106
E-mail: A.Schwartz@csuohio.edu

Project Reports:

Schwartz, A.H. (1996) Report of TEAM Project Evaluation Results. Department of Speech and Hearing, Cleveland State University.

Schwartz, A.H. (1996) Technology Enhances Accent Modification Instruction Effectiveness. Advances in Speech-Language Pathology and Audiology.(June 10, 1996)

Schwartz, A.H.(1995) Interim Working Paper on the FIPSE TEAM (Technology Enhanced Accent Modification) Project. Department of Speech and Hearing, Cleveland State University.

Schwartz, A., H., Brogan, V.M., Emond, G., and Oleksiak, J. F. (February 1993). ASHA (monthly magazine of the American Speech-Language-Hearing Association). Rockville, MD.

Executive Summary

Project Title: Technology Enhanced Accent Modification(TEAM) for International Teaching Assistants (ITAs)

Grantee Institution

Cleveland State University
Cleveland, OH 44115

Project Director:

Arthur H. Schwartz, Ph.D.
Professor, Speech and Hearing
Cleveland State University (MC418A)
Cleveland, OH 44115
(216) 687-6990
A.Schwartz@CSUOHIO.EDU

Project Overview

TEAM is an acronym for "technology enhanced accent modification". The TEAM Project was initiated to address complaints from students, enrolled in colleges and universities that their performance was adversely influenced by the nearly incomprehensible accents of their international teaching assistants (ITAs). We sought to develop multimedia software that operates on common personal computers, thereby making accent modification instruction more accessible at U.S. colleges and universities.

Purpose

The purpose of the TEAM Project has been to improve the quality of instruction provided to students enrolled in classes and labs taught by International Teaching Assistants. The specific objectives of the project have been to (1) develop reliable accent modification software that would operate on computers found at most higher education institutions; (2) to determine how TEAM based accent modification instruction impacted on the performance of students taught by ITAs; and (3) to disseminate the software to the institutions with the largest numbers of ITAs.

Background and Origins

The project grew from the convergence of three factors: (1) complaints from students that their performance was adversely affected by the accents of their foreign instructors; (2) complaints from international teaching assistants that they could not obtain the accent modification instruction they needed to address oral proficiency problems they had; and (3) developments in the area of multimedia software and sound processing technologies for personal computers.

Project Description

During the first two years of the project, efforts were focused on the development and testing of the software. Beginning the second year,

prototypes of the software were tested at Cleveland State University. The multimedia program developed by the TEAM project consists of consists of six components: (1) software that enables the user to retrieve, display, and play model utterances of speech features; (2) a 37 item computer based Accent Survey that assists in identifying features of accent that need to be modified ; (3) a curriculum that addresses the 15 features of speech that make accents most difficult to understand; (4) an instructional methodology designed to teach the international teaching assist how to assume control for monitoring as well as modifying his/her accent; (5) a database of 3600 (1800 male and 1800 female) model utterances containing accent features the ITA is modifying; and (6) a reference manual describing the operation of the program. Extensive online assistance is provided to assist users in answering questions about program operation and instructional techniques.

Evaluation

Two types of evaluation were conducted during the course of the project: testing and evaluation. Testing involved the actual operation of the software and hardware. Evaluation entailed determining the instructional effectiveness of the software and the impact on student performance.

There was an overlap between testing and evaluation. Design and testing consumed the first 24 months of the project. Actual evaluation took approximately 2 years, including the six month no-cost extension period.

The design and testing of software was conducted at Cleveland State University on systems acquired for this project. Original efforts to program in Asymmetrix Toolbook were abandoned after six months when they language was found incapable of performing the acoustic analyses needed. Subsequently, programming and debugging was done in Borland C++. Through testing, we identified and eliminated "bugs" by June 1994. During this time, prototypes were being used at Cleveland State University. Once a reliable version was developed, testing was expanded to other institutions. In over 2,000 hours of use since June 1994, the software has not failed because of programming problems.

Evaluations began during the latter half of the second year and the third year of the project. The project was field tested at Cleveland State University, Kent State University, and the University of Toledo. Project staff trained, and supervised tutors at both sites. Tutors were trained to follow the design protocol and to adhere to the TEAM instructional tactics. At each institution, data were gathered on both the performance of students taught by teaching assistants as well as the oral proficiency of the teaching assistants themselves. A repeated measures mixed design was used to evaluate: (1) type of teaching assistant; (2) student performance and (3) teaching assistant oral proficiency performance before and at several intervals following instruction.

Analysis of field test results indicates the following:

1.0 Students enrolled in classes taught by International Teaching Assistants receiving the TEAM instruction perform better than students enrolled in classes taught by ITAs who have had other forms of accent modification.

2.0 International Teaching Assistants (ITAs) receiving TEAM instruction perform better in the classroom than ITAs receiving other forms of oral proficiency instruction.

3.0 International Teaching Assistants (ITAs) receiving TEAM instruction make greater gains in oral proficiency.

4.0 International Teaching Assistants (ITAs) receiving TEAM instruction better long term retention of gains in oral proficiency.

Summary and Conclusions

The TEAM Project has developed multimedia software that can improve the quality of instruction provided to students enrolled in classes and labs taught by International Teaching Assistants (Its). More specifically, we: (1) developed reliable accent modification software that operates on the personal computers found at most higher education institutions; (2) compared the TEAM based accent modification instruction to other approaches to determine the efficacy of this approach; and (3) disseminated complimentary copies of the software to the 200 institutions with the largest numbers of ITAs.

On the basis of this project, the following conclusions have been drawn by the project staff: (1) accent modification can be delivered on low cost personal computers; (2) authoring languages lack the power and robustness for complex acoustic analyses; and (3) within an academic setting, political and territorial factors are greater obstacles to change than technological ones.

PROJECT OVERVIEW

TEAM is an acronym for "technology enhanced accent modification". The TEAM Project was initiated to address complaints from students, and their families, enrolled in colleges and universities that their performance was adversely influenced by the nearly incomprehensible accents of their international teaching assistants (ITAs). The project has developed accent modification software that would operate on common personal computers, thereby making instruction more accessible at U.S. colleges and universities.

The program developed by the TEAM project consists of six components: (1) software that enables the user to retrieve, display, and play model utterances of speech features; (2) a 37 item computer based Accent Survey that assists in identifying features of accent that need to be modified; (3) a curriculum that addresses the 15 features of speech that make accents most difficult to understand; (4) an instructional methodology designed to teach the international teaching assist how to assume control for monitoring as well as modifying his/her accent; (5) a database of 3600 (1800 male and 1800 female) model utterances containing accent features the ITA is modifying; and (6) a reference manual describing the operation of the program. Extensive on-line assistance is provided to assist users in answering questions about program operation and instructional techniques.

The project was field tested at Cleveland State University, Kent State University, and the University of Toledo. Field testing was conducted during the latter part of the second year and the third year of the project. Data were gathered on student performance in classes taught by four different types of teaching assistants. Data were obtained before, immediately after, three months after, and six months after instruction. Results were analyzed to determine the effect of instruction on student performance and ITA oral proficiency.

PURPOSE

The purpose of the TEAM Project has been to improve the quality of instruction provided to students enrolled in classes and labs taught by International Teaching Assistants (ITAs). The specific objectives of the project have been to: (1) develop reliable software that would operate on computers found at most higher education institutions; (2) to determine how TEAM based instruction impacted on the performance of students taught by ITAs; and (3) to disseminate the software to the institutions with the largest numbers of ITAs.

BACKGROUND AND ORIGINS

The TEAM Project grew out of a successful pilot study conducted in 1990 to determine if computer software could be used to increase the oral proficiency of international teaching assistants who

had failed their oral proficiency exams and were prohibited from assuming their teaching duties. The pilot project arose because of the problems students were having understanding their international teaching assistants (ITAs) and the difficulties ITAs themselves have obtaining accent modification instruction.

A review of the literature in higher education revealed that the oral proficiency problems of ITAs was a national problem at U.S. colleges and universities. In 1991-92, there were nearly 500,000 international students enrolled at the 3,600 colleges and universities in the U.S. While the majority of international students were pursuing graduate studies, an estimated 45,000 were considered graduate assistants with teaching responsibilities. While most institutions offered remedial work in ESL (English as a Second Language) only a small portion of universities offered courses or services for ITAs to improve their accent. There was a consensus that there was a need to increase access to accent modification in order to improve the performance of students enrolled in classes taught by ITAs.

At approximately the same time, developments in personal computers, improved digital sound processing chips, and the emergence of multimedia suggested that it might be possible to develop instructional software for accent modification. It was hypothesized that if it were possible to develop multimedia based accent modification software, then accent modification instruction could be accessible on more colleges and universities that utilized international teaching assistants.

PROJECT DESCRIPTION

The TEAM Project has six characteristics which differentiate it from other approaches to accent modification. It: (1) addresses the **prosodic** (pitch, loudness, timing) features of accent as well as pronunciation of consonants and vowels; (2) provides **multisensory instruction and feedback** by using technology to enable ITAs to see as well as hear their speech; (3) contains a built-in **curriculum** that addresses the 15 features, or topics, of speech that will make an accent more understandable; (4) is designed to be used by **tutors** (preprofessional or graduate students), thereby lowering delivery costs; (5) employs **tactics** designed to teach the ITA how to assume responsibility for maintaining the improvements he or she learns; and (6) it utilizes off-the-shelf **personal computers** that are widely available and affordable to colleges and universities.

Attention to Prosody

The accents of nonnative speakers have two generate characteristics. First, their pronunciation of consonants and vowels differs from speakers of American English. Second, the prosody (tone, loudness, and timing) of their native language often differs significantly from that of American English. In general, American listeners are more tolerant of the accents of European speakers because the prosody of their

language is similar to American English. However, listeners in general, and college students in particular react adversely to foreign instructors whose prosody as well as pronunciation is different.

Modifying the prosodic features of an accent achieves the greatest impact on a the understandability of an accent. Yet the majority of accent modification approaches tend to focus on the pronunciation of consonants and vowels. In the past, efforts to modify prosody have met with limited results because of the subjective and temporally fleeting nature of pitch, loudness, and timing changes while talking..

The TEAM Project places greater emphasis on the prosodic features of speech. Based on our review of the literature, it was our hypothesis that greater changes in speaker performance, and indirectly student performance, should be obtained by focusing on the "music" (prosody) of speech rather than the "notes" (pronunciation) of speech.

Multisensory Instruction and Feedback

The limitations of previous attempts to teach prosody may be attributable to the delivery system rather the methodology. Most accent modification instruction is aural (listening)/oral (speaking). The visual modality has been used successfully when teaching pronunciation, but has had limited impact on modifying prosody . Using line drawings and pictures, instructors can show students where to place their tongue and lips to produce specific speech sounds. Perhaps because of being able to see, as well as hear, it is easier to teach (and to learn) pronunciation than prosody. Graphic systems have been developed to illustrate prosodic features such as stress or intonation. Unfortunately, they are subjective, abstract and impractical.

The more ways an ITA can sense (seeing, hearing, feeling) a feature, the easier it is to learn and to use. The technologies employed by TEAM enable ITAs to see as well as hear the features of prosody they are learning. The tactics we employ, in combination with the technologies, enable the ITA to develop the skill and understanding to retain the improvements that are made possible by the software.

Curriculum

There are at least 100 features of an accent that could interfere with a speaker's efforts to communicate. Not all have equal impact on the listener. The Pareto Principle had significant in the selection of the content to be taught. This principle (borrowed from economics) holds that in most situations, 80% of the results can be attributed to 20% of the effort. In business, as an example, 80% of sales may come from 20% of the product line. The Pareto Principle suggests that 80% of the results from accent modification could be attributed to 20% of the features taught - if this principle applied to accent modification. An extensive review of the literature was conducted to identify those features addressed by

different approaches to accent modification. A core features was identified from the 30 most widely cited texts and articles in the area. These features were selected to be the core of the curriculum for the TEAM project.

Eight of the 15 instructional topics addressed by the TEAM approach focus on the prosodic features of speech. These include: contrastive stress, contractions, intonation, intrusive sounds, phrasing, speech flow, syllable stress, and word focus. Four topics address vowels (back vowels, front vowels, diphthongs, and vowel reductions) and the remaining three topics address pronunciation of consonant sounds (consonant voicing, sound deletions and word endings). For each instructional topic, 120 model utterances of varying length and complexity that exemplify that topic have been digitally recorded and stored.

ITAs progress through four levels of instruction for each topic as they are modifying their use of that feature: (1) listening and evaluating the appropriateness of the feature in the speech of others; (2) establishing and monitoring their own production of the feature in words, phrases, and sentences; (3) mastering their use of and monitoring of, the feature in longer and more complex utterances, and (4) review at a later time to prevent regression. There are 30 model utterances at each level, yielding a minimum of 120 opportunities for the student to practice that feature as she/he is learning to modify the particular feature.

Tutors

TEAM uses preprofessionals and paraprofessionals as accent modification tutors. Ideally, international students should be able to obtain accent modification from English as a Second Language courses or from a Speech and Hearing Clinic. In reality, neither English as a Second Language Programs nor Speech and Hearing Departments are equipped to deal with the large number of international students needing accent instruction. Most of the English as a Second Language Programs offer instruction in reading, writing, vocabulary and grammar. Some do offer instruction in oral communication, but the approach is on general communication skills rather than accent. Speech and Hearing Clinics (available on only 10% of college and university campuses) give priority to communicatively impaired children and adults. If they do accept international students for accent modification, the primary focus is on mastery of specific consonants or vowels rather than general speech comprehensibility. The international student who wants, and needs, accent modification is left "between a rock and a hard place."

The TEAM Project takes the position that if American English speaking undergraduate or graduate students are appropriately trained and supervised, they can use technology to enhance instruction for a core set of accent features. Potential tutors have been recruited from appropriate majors including English,

Linguistics, English as a Second Language, Speech and Hearing, etc. Tutors can be trained to competently use the approach in a two day workshop followed by ongoing supervision. Within 3 weeks, tutors become adept at using the process.

Tactics

A fundamental goal of the TEAM Approach is to teach ITAs how to assume the responsibility for monitoring as well as modifying their speech. It is not uncommon to see regression in a persons speech as more and more time elapsed since she/he completed instruction. It may be that while the ITA learned to modify his or her accent, she or he did not develop the self monitoring skills necessary to keep things "on track." The TEAM approach uses four instructionally sound techniques to guide ITAs toward assuming control for modifying their accents: (1) cueing and prompting the learner to change his/her speech to match the model utterance; (2) evaluating whether the It's attempt matches the model utterance; (3) commenting on reasons for discrepancies between the model and the speaker's utterance; and (4) suggesting changes to match the feature in the target utterance. At first, the tutor monitors the ITA's progress by evaluating, commenting and suggesting changes. As instruction progresses, the ITA assumes more responsibility for evaluating, evaluating and commenting, and finally for evaluating, commenting, and suggesting. In this way, the ITA learns to monitor as well as modify her/his accent. Similarly, this approach enables us to shift the responsibility for evaluating and commenting from the tutor to the ITA. If gains are to be retained, the ITA has to be responsible for monitoring his/her own speech.

Technology

Technology is the final innovative feature of the TEAM Project. Technology is a means not an end unto itself. We have adopted technology because we believe that it is the best tool for permitting the learner to see as well as hear what they are learning to say. The technology component of the TEAM Project is also based on the premise no matter how effectiveness and efficient, unless users find the software engaging, flexible, navigable, they will be reluctant to use it.

Every effort has been made to make the technology employed by the TEAM Project user friendly and transparent. The technology has been designed to be engaging, flexible and navigable. Inexperienced computer users were hired to use the program to enable us to identify problems in operation. Experienced computer users and tutors provided feedback on problems, questions, and suggestions throughout field testing. Feedback from users at test sites indicates this objective as been obtained.

Costs for computer systems have decreased to the point where it is feasible for colleges and universities to use technology for accent modification. The TEAM software runs on equipment that is

widely available and reasonably affordable for most colleges and universities. The following equipment is needed to operate the TEAM software:

- A MS-DOS Compatible 486 computer operating at least 50 to 66 Megahertz;
- At least 8 megabytes of memory (RAM).
- A SoundBlaster 16 , Soundblaster AWE32 Sound Card or an IBM Audio Capture and Playback Adapter Card.
- A Double or Quad speed Compact Disk Player.
- An SVGA color monitor.
- A high quality microphone with amplifier.
- High quality audio speakers.
- A mouse pointing device.
- Microsoft Windows 3.1 or higher.

Without the computer, it would not be possible to combine visual images and audio recordings. Visual displays enable the student to "freeze" the utterance and both see and hear it. Students are able to verify what they are doing quickly and easily. There are other computer programs and laboratory instruments (Ani-Vox, IBM's SpeechViewer II, Indiana University's Indiana Speech Training Aid, Kay Elemetric's Visi-Pitch, and Microvideo's Video-Voice) that provide graphic displays of speech features. The TEAM approach differs from them in four ways. First and foremost, our approach links the content (instructional topics) with the delivery system (technology). Second, our approach emphasizes prosody more than pronunciation of consonants and vowels. Third, our software operates in a Windows setting, thereby freeing the tutor and the student to concentrate on the teaching process rather than operating a computer. Lastly, our approach takes advantage of off-the-shelf hardware devices rather then expensive laboratory equipment.

PROJECT EVALUATION

Evaluation Questions

1. Does TEAM accent modification instruction improve performance of students enrolled in classes taught by Teaching Assistants?

    a. Is there any difference in classroom performance of students enrolled in classes taught by ITAs who have received TEAM instruction from students enrolled in classes taught by other ITAs?

    b. Is there any difference in retention/attrition of students enrolled in classes taught by ITAs who have received TEAM instruction from students enrolled in classes taught by other ITAs?

c. Is there any difference in frequency of drops and switches of students enrolled in classes taught by ITAs who have received TEAM instruction from students enrolled in classes taught by other ITAs?

2. Does TEAM accent modification instruction improve the oral proficiency of International Teaching Assistants?

   a. How does type of accent modification instruction affect the oral proficiency of teaching assistants?

   b. How does type of accent modification instruction affect the frequency of speech sound mispronunciations of teaching assistants?

   c. How does type of accent modification instruction SPEAK test of oral proficiency performance of teaching assistants?

Population Characteristics

One hundred and twenty eight teaching assistants at three different universities were evaluated during the field testing phase of the TEAM Project. Specific demographics about such variables as age, country of origin, major, TOEFL scores are provided in Appendix A.

Evaluation Methodology

To answer the evaluation questions, an three factor design was employed. The three factors were: (1) type of teaching assistant; (2) performance measures; and (3) frequency of instructor evaluation. The independent variable was teaching assistant status. The dependent variables were performance on measures of oral proficiency and time of evaluation. Data were obtained on 128 Teaching Assistants at Cleveland State University, Kent State University, or the University of Toledo.

Type of Teaching Assistant

Teaching assistants were divided into four groups as follows: (1) thirty two American Teaching Assistants (AM-TA) who were native speakers of American English: (2) thirty-two International Teaching Assistants (EX-ITA) who were not native speakers of American English and who *passed* the oral proficiency testing requirement of their institution and therefore were exempted from requirements to take additional instruction to improve their communication skills; (3) thirty-two International Teaching Assistants (OP-ITA) who were not native speakers of American English and who *failed* the oral proficiency testing requirement of their institution and therefore were required to obtain instruction (either English as a Second Language classes or Speech Therapy) to improve their oral proficiency; and (4) thirty-two International Teaching Assistants (TEAM-ITA) who were not native speakers of American English

and who *failed* the oral proficiency testing requirement and therefore were required to address their oral proficiency deficit by receiving instruction using the TEAM software.

Performance Measures

Two types of performance measures were obtained. First, the performance of students enrolled in classes and labs taught by teaching assistants was evaluated to determine how their instructor affected their performance. Second, the performance of the teaching assistants themselves was evaluated to determine if instruction affected their oral proficiency.

Student Performance

Three measures were used to evaluate the consequences of accent modification instruction on the performance of students enrolled in classes taught by teaching assistants: (1) course grade averages and distributions; (2) enrollment retention/attrition data; and (3) student ratings of instructor teaching effectiveness.

Grades for sections of classes taught by teaching assistants were compared at the end of the first term the ITA assumed teaching responsibilities (typically at Retest2).. Mean grade point average as well as distribution of grades were analyzed.

Enrollment data was analyzed to determine if there was any difference in student retention/attrition for different types of teaching assistants. Drop rate is, typically, higher for sections taught by teaching assistants. Drops can be influenced by a number of factors (personal, economic, and logistical) beside dissatisfaction with an instructor. When there are two sections of a course or lab that are taught at the exact same time by two different teaching assistants, then it is likely that switches from one section to another would likely be related to teaching assistant variables. Enrollment data for 54 sections of courses taught by teaching assistants were analyzed to determine if drops and switches were influenced by teaching assistant type.

A Ratings of Teaching Assistant Speech Patterns was designed to evaluate student rating of specific aspects of instructor oral proficiency on their class performance. This 20-item multiple choice questionnaire contained items designed to assess the student's judgment of how the instructor's speech patterns affected their learning/course performance was well as student awareness of general and specific features of instructor speech patterns. Ratings were scored and compared for each question for the four groups of teaching assistants.

ITA Oral Proficiency Performance

Three measures were employed evaluate the consequences of accent modification instruction on the oral proficiency of the four groups of teaching assistants: (1) SPEAK test scores; (2) Accent Survey scores; and (4) number of speech sound mispronunciations.

The SPEAK is a standardized assessment measure developed by the Educational Testing Service to assess a nonnative speaker's oral proficiency on a variety of structured and spontaneous speaking tasks. It is widely used by American colleges and universities as a criterion measure for determining whether a perspective teaching assistant demonstrates an adequate level of oral communication skills to go into the classroom. The SPEAK is a normed test measure that yields a score ranging from 0 to 300. In general, institutions participating in the present study used a cut-off score of 230 to determine eligibility/ineligibility to teach.

The TEAM Accent Survey is a criterion referenced measure designed to assess a speaker's use of the features of speech that make accents difficult to understand. It consists of 37 sentences that are deliberately loaded with words, phrases, and patterns of speech that are difficult for foreign speakers. The TEAM Accent Survey yields a score from 0 to 78 representing the number of appropriate usage of accent features such as syllable stress, consonant voicing, phrasing, etc. Performance was measured for all TAs for Base and Retest1. Performance on the Accent Survey was evaluated for teaching assistants in the OP-ITA and TEAM-ITA groups for Base, Retest 1, 2 and 3

Number of speech sound mispronunciations were measured using the Sikorski Oral Proficiency Test. Teaching Assistants read each of the 54 words (containing a total of 200 consonant and vowel sounds) comprising this measure, and the accuracy of their performance is evaluated. A score, representing the total number of mispronunciations was derived. Mispronunciation counts for all TAs were obtained for Base and Retest1. Mispronunciation counts were obtained for all teaching assistants in the OP-ITA and TEAM-ITA group for Retest2 and Retest3

Frequency of Evaluation

All teaching assistants participating in this project were evaluated at the beginning of the term and at the end of the term when instruction was received. Student and teaching assistant performance measures were obtained for American TAs (AM-TA) and exempted international teaching assistants (EX-TA) at the beginning of the term (base) and at the end of the term (Retest1). ITAs receiving the oral proficiency (OP-ITA) or TEAM (TEAM-ITA) approaches were evaluated at the beginning of the term (base), immediately after one term of instruction (Retest1), three months after completing instruction (Retest2), and six months after completing instruction (Retest3).

Evaluation Results

The effect of type of accent modification instruction on students and teaching assistants were examined. The effect of each type of instruction on performance was analyzed through a series of successive applications of Analysis of Variance. Contrast Coefficient Matrices and Student-Newman-Kuels post hoc analyses were obtained to identify interactions and determine their significance.

Student Performance

Course Grades

Number and percent of grades for 1301 students enrolled in 54 classes taught by teaching assistants are shown in Table 1. A single factor Analysis of Variance was employed to determine the effect of type of teaching assistant on student grades. There was no significant difference in class size. . The mean GPA for sections taught by all teaching assistants was 2.41 on a 4.o scale. The Analysis of Variance showed a statistically significant difference between groups [$F(3,1151) = 6.95$, $p<.0001$)].

Table 1: Distribution of course grades in sections taught by teaching assistants.

	AM-TA		EX-TA		OP-ITA		TEAM-ITA		TOTAL	
	#	%	#	%	#	%	#	%	#	%
A	39	11.89	37	11.78	47	14.41	58	17.41	181	13.91
B	71	21.64	85	27.07	83	25.46	91	27.32	330	25.36
C	117	35.67	101	32.16	130	39.87	111	33.33	459	35.28
D	40	12.19	31	9.87	25	7.66	26	7.80	122	9.37
F	23	7.01	18	5.73	12	3.68	11	3.03	63	4.76
LOSS	38	11.58	44	14.01	29	8.89	35	10.51	146	11.22
TOTAL	328		314		326		333		1301	100

Figure 1 illustrates the differences in mean course grade point for students enrolled in classes taught by different types of teaching assistants. Students enrolled in classes taught by TEAM-ITAs earned a higher course grade (mean=2.71). There was a higher distribution of A and B grades in the foreign teaching assistant groups (EX-ITA, OP-ITA, and TEAM-ITA). The higher education literature contains studies indicating that foreign teaching assistants may be more lenient in their grading standards. Student grades in classes taught by ITAs may be as much as a half a grade higher than grades for students taught by American Teaching Assistants. *As a unitary measure of outcomes, the statistical difference between grades earned by students taught by ITAs is somewhat suspect.* Other measures, such as enrollment

retention/attrition should be considered in combination with grade distributions to understand the relationship of instructor accent and student performance.

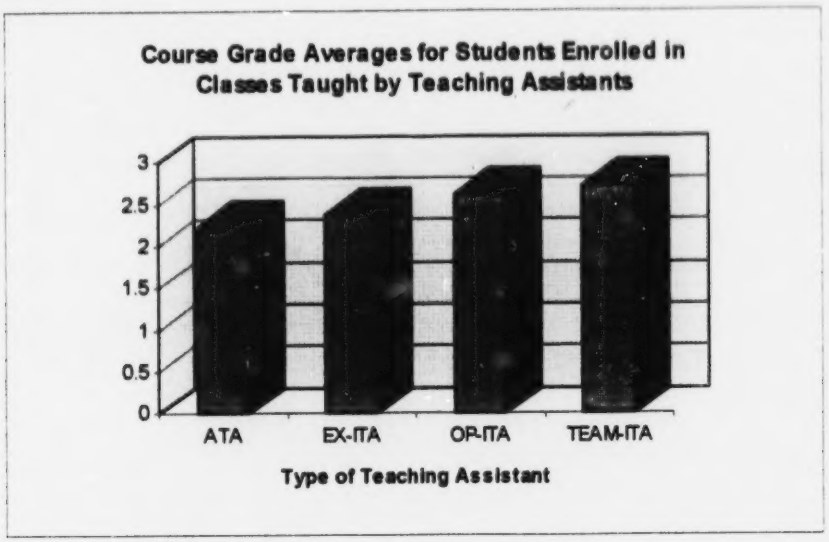

Figure 1. Mean course grade point averages for students taught by teaching assistants.

Enrollment Retention/Attrition

Enrollment data (retention and attrition), in conjunction with grades, may provide a more meaningful representation of outcomes on student performance. Overall, 82%, or 1076, of the 1301 students taught by teaching assistants completed their courses/labs. There was an overall loss of 146 students, or 17.5%, for all groups. Loss rate in sections taught by TEAM-ITAs averaged 16% which was not significantly different from that of AM-TAs and EX-TAs. . OP-ITAs, on the other hand, had a 26% loss rate, which was the highest for the four groups.

Overall attrition rate may be misleading, however. In actuality, two types of attrition can be identified: (1) course drops and (2) section switches. Dropping of a course may be due to a number of reasons other than the type of teaching assistant. A more telling measure of teaching assistant impact is section switches. Section switches occur when there are two sections of a class or lab scheduled at the exact same time. When a student switches from one section to another, it is most likely to reflect something about the instructor rather than the course content or scheduling. Switching from a section taught by an ITA to a section of the same course taught by another teaching assistant may be indicative of a student's unwillingness to struggle to understand the instructor.

Figure 2 displays the analysis of the type of attrition according to each type of teaching assistant. Each group had both drops and switches. The majority of attrition for AM-ITAs and EX-ITAs was the result of drops rather than switches. Attrition in classes taught by OP-ITAs was significantly higher

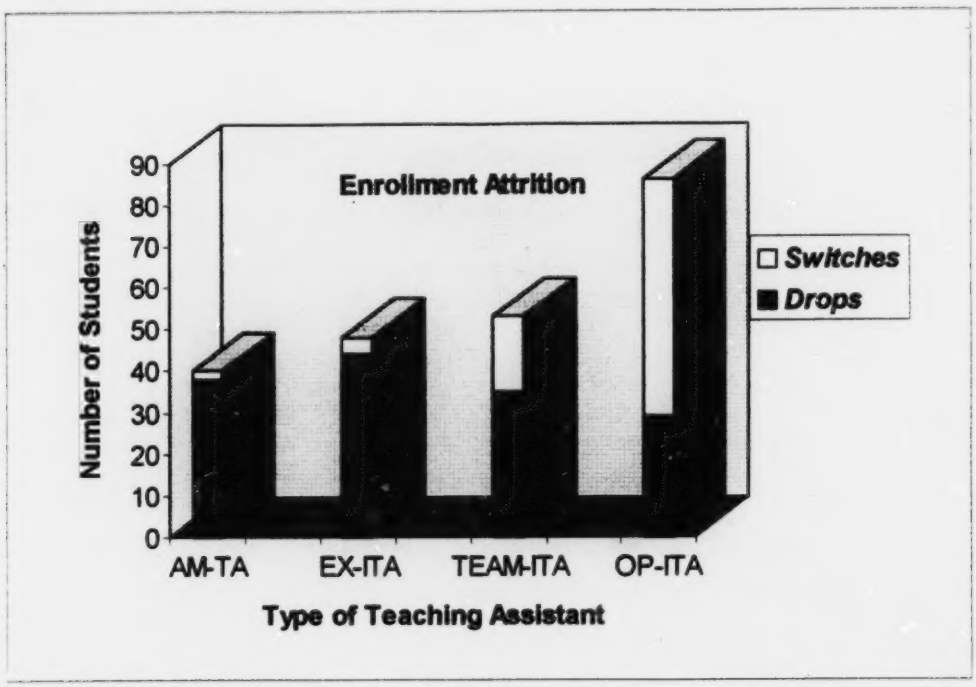

Figure 2. Analysis of source of enrollment losses by teaching assistant type.

than for classes taught by other teaching assistants. Nearly two thirds of enrollment losses in the OP-ITA group were the result of section switches rather than drops. Switch rate was higher in the TEAM-ITA was significantly lower than that encountered in the OP-ITA groups.

ITA Teaching Ratings

Traditional teaching rating forms used by the field test institutions had fewer than four questions about the instructor's teaching style and seldom addressed the area of accent. A 20 item, multiple choice accent survey was developed and administered to students enrolled in sections taught by teaching assistants to obtain information about: (1) effect of ITA speech patterns on student classroom performance; (2) general awareness of instructor speech patterns; and (3) awareness of specific features of instructor speech patterns.

Ratings were tabulated and both frequency and percent of responses for each question were derived. Because of space constraints in this report, this information is contained in Appendix B. Ratings

were consistently highest for the speech patterns of the AM-ITAs. The EX-ITAs most closely resembled the American Teaching Assistants. The OP-ITAs scored poorest on items pertaining to effect on student grade, effort needed to understand the instructor, and specific aspects of accent including prosody and pronunciation. ITAs in the TEAM group performed better than the OP-ITAs on items pertaining to the prosodic features of an accent. This is not unexpected since the TEAM-ITAs received significantly more instruction in that area. What is interesting is the finding that on items pertaining to pronunciation of consonants and vowels (5, 11 and 13) the OP-ITAs did not perform consistently better. In fact, even after instruction, nearly 64% of the students enrolled in classes taught by OP-ITAs reported their instructor "pronounces a large number of consonants differently from American English." This is surprising, since the focus of their instruction was pronunciation. It would appear that modifying prosody produces improves pronunciation, whereas modifying pronunciation does not improve prosody.

More students in classes taught by TEAM-ITAs indicated that their instructor was aware of his/her speech or took efforts to make changes if the student had difficulty understanding. Few students noted that the OP-ITA took particular steps to clarify something when students had difficulty understanding them.

How closely the student has to attend to the instructor's speech may have an influence on the student's performance. Seventy-five percent of students in classes taught by TEAM-ITAs reported it took little or no effort to understand their instructor. On the other hand, 49% of the student's in classes taught by OP-ITAs rated their instructors as highly.

Perhaps the most telling item is number 10. This item asks the student to evaluate how the instructor's teaching effectiveness is affected by her/his accent. Seventy percent of students in classes taught by the TEAM-ITAs reported that their instructor's speech did not affect his/her teaching effectiveness. Again, roughly half (49.8%) of students in classes taught by OP-ITAs gave the same rating.

ITA Oral Proficiency

Three major features of accent were assessed before and after instruction for teaching assistants in each group. The results of that analysis are displayed in Table 2.

Table 2 Performance of teaching assistants on measures of oral proficiency

Measure	Test	AM-TA		EX-TA		OP-ITA		TEAM ITA	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
	Base	286.34	17.56	242.40	16.07	193.62	13.73	194.87	16.1
SPEAK	Retest 1	288.71	16.75	245.68	12.99	238.37	17.44	238.37	14.93
Test	Retest 2	NA	NA	NA	NA	234.31	15.40	243.96	12.99
	Retest 3	NA	NA	NA	NA	238.09	25.4	243.59	14.20
	Base	74.96	2.61	66.23	11.25	48.40	7.22	47.53	7.31
Accent	Retest 1	74.56	2.30	66.88	10.86	56.53	5.60	62.93	6.72
Survey	Retest 2	NA	NA	NA	NA	53.50	6.01	63.31	7.09
	Retest 3	NA	NA	NA	NA	50.25	5.98	63.00	6.51
	Base	1.30	1.87	17.07	4.47	35.21	10.77	35.84	9.06
Pronunc.	Retest 1	1.40	1.09	17.34	4.13	24.06	8.09	27.09	5.99
Errors	Retest 2	NA	NA	NA	NA	25.83	8.10	30.12	7.78
	Retest 3	NA	NA	NA	NA	26.87	8.33	31.75	8.42

SPEAK Test Scores

Accent modification instruction did have a positive impact on the performance of teaching assistants on the SPEAK Test. At baseline testing, there were significant differences in the mean SPEAK scores for the AM-ITA (mean = 286.34) and the EX-ITA (mean=242). There were no significant difference in base SPEAK scores for the OP-ITA and the TEAM-ITA groups.

What is relevant is the comparison of baseline and retest 1 SPEAK test scores. A one-way Analysis of Variance showed a statistically significant [$F(3,124)=252.621$, $p<.0001$] between groups at Base and Retest1. Teaching assistants in the AM-TA and EX-ITA showed no significant changes in their SPEAK test scores at Retest1. Teaching assistants in both the TEAM-ITA and OP-ITA both showed statistically significant increases in SPEAK Test scores on Retest1.

The Contrast Coefficient Matrix indicated between Base (mean=193.62) and Retest1 (mean=238.37) for the OP-ITA was statistically significant [$T= 3.245$, $p=<.001$]. Similarly, for the TEAM-ITAs, the difference between the Base SPEAK score (mean=194.87) and Retest1 (mean = 238.37) was statistically significant [$T= 3.406$, $p=<.001$]. Figure 3 illustrates the differences in SPEAK test scores for each group.

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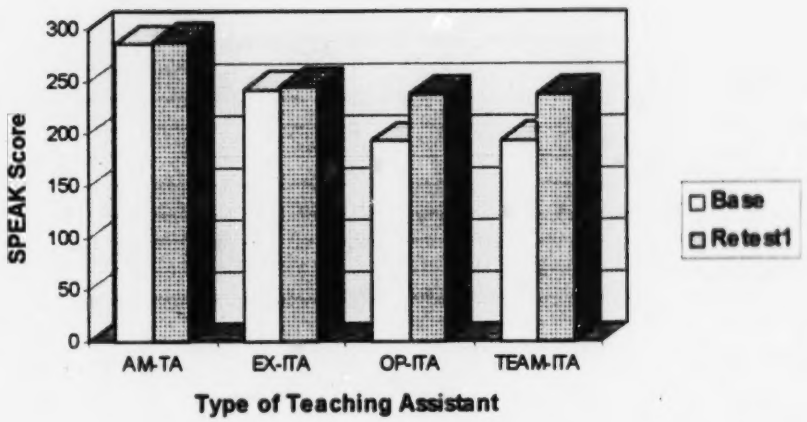

Figure 3. Comparison of SPEAK Test performance for each group at Base and Retest1.

SPEAK Test performance was reassessed for subjects in the two experimental groups at 3 months (Retest2) and six months (Retest3) following instruction. This is shown in Figure 4. Both groups held their gains. The OP-ITA group gains showed a drop from 238.37 at Retest2 to 234.31 at Restest3. However, at Restest3, OP-ITA group scores were essentially the same as at Retest 1. ITAs in this group held their gains in SPEAK test performance. The TEAM-ITA group continued to show a slight improvement in scores at Retest2 and Retest3.

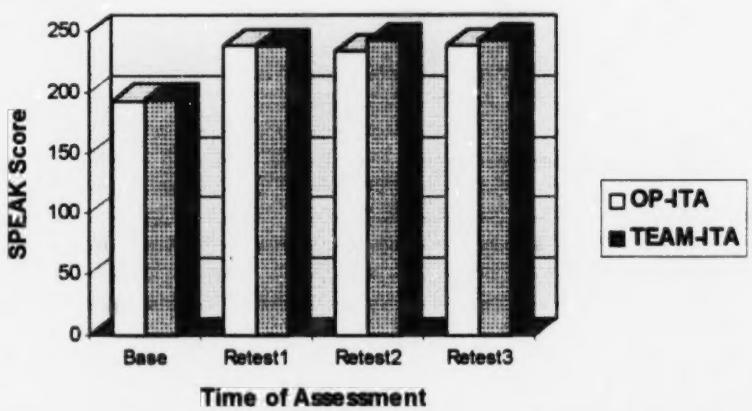

Figure 4 Comparison of SPEAK Test performance at Base, Retest1, Retest2, and Retest3.

Accent Survey

The TEAM Accent Survey is a criterion referenced measure developed to identify which features of accent need instruction. The survey consists of 37 sentences that are loaded with the features of accent addressed by the instructional program. Raters score the presence or absence of a particular feature and the computer keeps a tally of the frequency of occurrence. Decisions regarding which topic to teach are based on cut-off scores. A person can obtain a score from zero to 78 on the survey, with 78 indicating a perfect score. Mean survey scores for teaching assistants are reported in Table 2 before and after instruction. Data were analyzed using a One Way ANOVA.

Baseline: There were no statistically significant differences between the AMER-ITA and EX-TA on baseline scores. There were no significant differences between the OP-ITA (mean = 48.40) and TEAM-ITAs (47.53) on baseline. The AMER-ITAs and EX-ITAs were, as would be expected, significantiy different from the two experimental groups at the time of baseline assessment.

Baseline vs. Retest1: There were no statistically significant differences between the AMER-ITA and EX-TA from baseline to retesting approximately three months later. At Retest1, TEAM-ITAs showed an average gain of 15.4 points between the pretest (mean=47.53) and retest1 (mean=62.93). The gain of TEAM-ITAs was statistically significant [t=11.93, p<.00. OP-ITAs showed a mean gain of 8.13 between the pretest (mean = 48.40) and retest1 (56.53). TEAM-ITAs made significantly greater gains in performance on the Accent Survey than did the OP-ITAs. Figure 5 shows the accent survey scores for the four groups of teaching assistants at baseline and retest1.

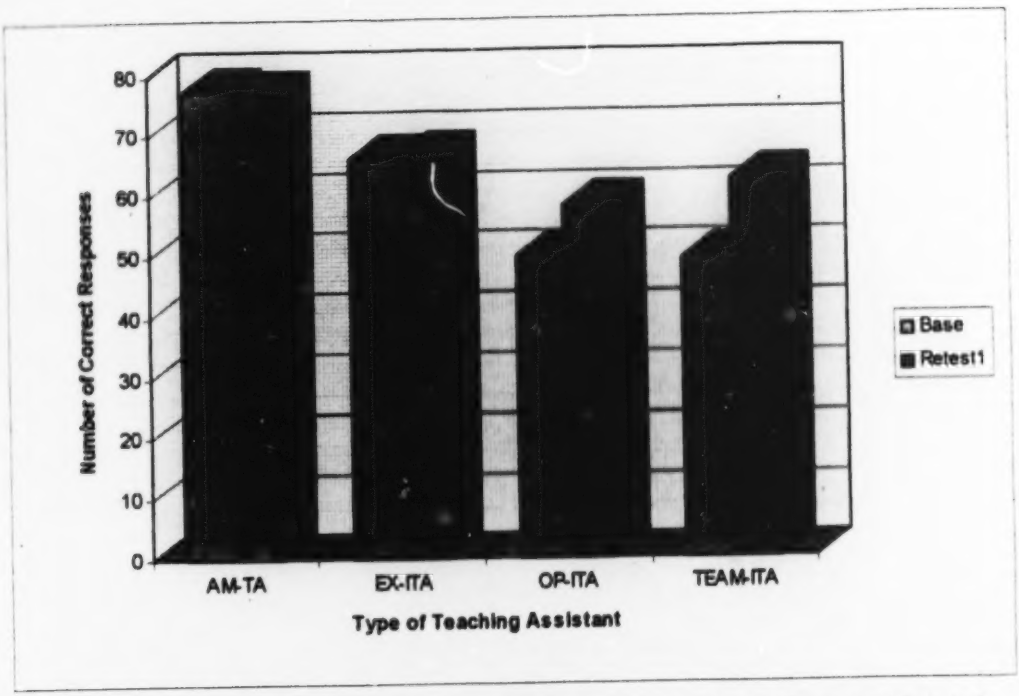

Figure 5. Comparison of Teaching Assistant Performance on the Accent Survey at Base and Retest1.

The Accent Survey was administered three months after completion of accent modification instruction (Retest2) and six months following completion of instruction (Retest3) to determine if gains were retained. A one way ANOVA indicated significant differences between Restest1 and Retest2 [$F_{3,125}=69.7$, $p<.001$) substantiating that gains were retained. The mean scores for each group at Base, Retest1, Retest2 and Retest3 are illustrated in Figure 6. ITAs in the TEAM-ITA group maintained gains at retest2 (mean=63.31) and retest3 (mean = 63.00). ITA's in the OP-ITA group, on the other hand, showed a regression on retest 2 (mean = 53.50) and retest3 (50.25). Six months after completing accent modification instruction, OP-ITAs had regressed to near baseline scores. In fact, the six month retest scores for the OP-ITAs (mean = 50.25) were not statistically different from their baseline scores (mean = 48.40). These findings indicate that, on this particular measure, TEAM-ITAs make and hold gains, while OP-ITAs lose whatever gains they make almost as soon as instruction is finished.

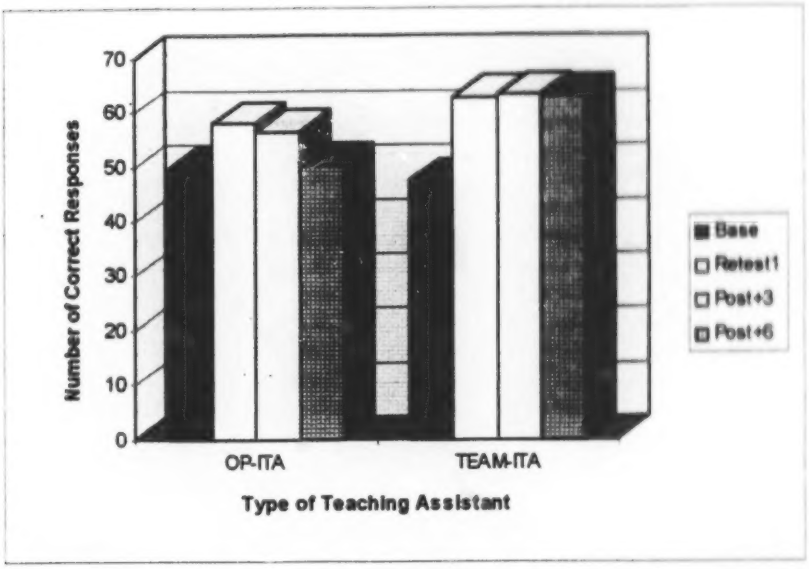

Figure 6. Changes in Accent Survey Performance of International Teaching Assistants at Four Different Times

The regression in Accent Survey scores shown by the OP-ITAs is not surprising since this measure is skewed toward the prosodic features of an accent. For many OP-ITAs, accent modification instruction was focused more on pronunciation of consonants and vowels than prosody. However, when this finding is considered in light of the teaching ratings in Appendix B, it suggests that a technology based approach that emphasizes prosodic features may have a greater impact on student performance and satisfaction than an approach that emphasizes pronunciation alone.

Speech Sound Mispronunciations

Frequency of mispronunciation of consonant and vowel sounds was assessed. The oral proficiency approach (OP) places major (if not exclusive) emphasis on the appropriate production of speech sounds. The TEAM approach, on the other hand, places a primary emphasis on the prosodic features of speech and secondary emphasis on pronunciation features. Whereas greater than 80% of the time and effort in the OP approach is devoted to pronunciation, only 20% of the time in the TEAM approach was devoted to pronunciation.

We had hypothesized that: (a) OP-ITAs would show greater gains in pronunciation accuracy than TEAM-ITAs; and (b) that OP-ITAs would show better retention of gains in pronunciation accuracy than TEAM-ITAs. Figure 7 illustrates the

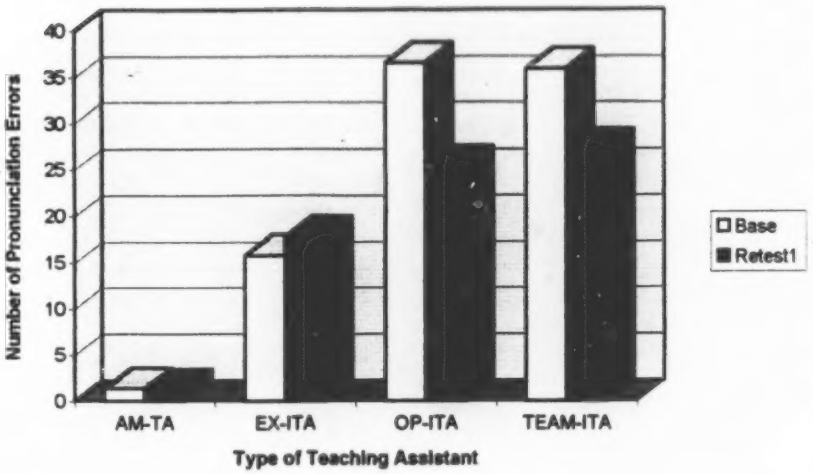

Figure 7. Comparison of pronunciation errors of teaching assistants between baseline assessment and retest1.

differences between all groups with respect to number of speech sound mispronunciations at base and retest1. Teaching assistants in the AM-TA group showed some (mean = 1.30) differences in sound pronunciation, probably due to regional or racial dialects. While their oral proficiency scores were adequate to enable them to assume teaching responsibilities, teaching assistants in the EX-ITA group had an average of 17.07 speech sound differences on the Sikorski test. At base assessment, there were no significant differences in pronunciation errors for the TEAM-ITA (mean = 25.84) and the OP-ITA (mean = 35.21).

There were significant decreases in the pronunciation errors of TEAM-ITAs and OP-ITAs on retest1. The TEAM-ITAs had an average of 8.75 fewer errors on retest1. The OP-ITAs had an average of 11.15 fewer errors on retest1. The OP-ITAs had fewer errors on Retest1 than the TEAM-ITAs. This finding is logical, since the OP-ITAs received more than 20 hours of instruction emphasizing speech sound pronunciation. On the other hand, of the average of 22 hours of accent modification instruction received by the TEAM-ITAs, less than 5 hours was devoted to the production of vowels and consonants. The finding that the TEAM-ITAs made appreciable gains in error reduction indicates that there may be a "spillover" effect from this approach that enhances its pedagogical and economic effectiveness.

ITAs in the TEAM and OP groups were retested at three and six month intervals following completion of accent modification instruction. Figure 8 displays data illustrating changes in pronunciation errors across time for ITAs in both groups. Both groups showed significant reductions in pronunciation

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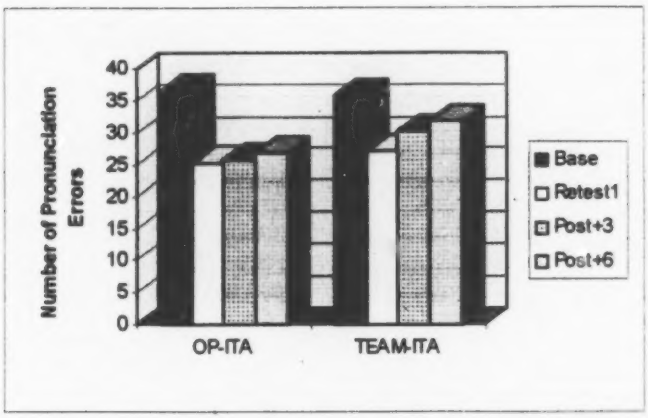

Figure 8. Changes in OP and TEAM-ITA pronunciation errors at intervals following accent modification instruction.

errors after receiving accent modification instruction. Note, however, the regression, or increase in errors at subsequent intervals. Both groups showed that regression occurred over time. This chart shows that the TEAM-ITAs lost much of the gains (mean of 31.75 errors at six months) they made. This is not surprising given the time and effort devoted to pronunciation in the TEAM approach. The OP-ITA group retained much of the gain they made. In light of regression on other measures as well as the data on student performance, it appears that reduction of pronunciation errors has little effect on ITA classroom performance.

DISSEMINATION ACTIVITIES

Several different activities were undertaken to disseminate information about the project and its results. Articles and feature stories on the project were published in local (Cleveland Plain Dealer) and national (Chronicle of Higher Education) media. Presentations on the project were made at conventions of the American Speech Language and Hearing Association (1992, 1995), the English Speaking Union (1995) and Teaching English to Speakers of Other Languages (1996). In 1995, the project received the National Award for Innovations in Teaching English from the English Speaking Union of the United States. Articles on the TEAM Project were published in Asha (September 1993) and Advances in Speech-Language Pathology (June 1996). Articles describing the project and findings are being prepared for TESOL Quarterly, Systems, Language and Speech, and the Journal of Speech-Language Pathology.

The compact disk was pressed and a reference manual was printed after feedback from field test sites was obtained. Complimentary copies of the software and documentation were distributed to the 200 colleges and universities with the highest international student enrollments according to the Open Doors

(1995) Report. While representing less than 10% of U.S. colleges and universities, these 200 schools account for nearly 40% of international teaching assistant enrollments. Tiger Electronics of Seattle, Washington is marketing the software at an educational discount price $395.00.

SUMMARY AND CONCLUSIONS

Summary

Based on the field testing evaluations conducted on 128 teaching assistants at three different universities, the following conclusions have been drawn about the impact of the TEAM Project:

1.0 International Teaching Assistants (ITAs) receiving TEAM instruction perform better in the classroom than ITAs receiving other forms of oral proficiency instruction.

1.1 Students enrolled in classes taught by ITAs receiving TEAM instruction obtained only slightly higher grades than students enrolled in classes taught by other instructors.

1.2 Fewer students switched out from classes/labs taught by ITAs receiving TEAM instruction.

1.3 ITAs receiving TEAM Instruction score higher class teaching ratings than ITAs who have received other forms of oral proficiency instruction.

2.0 International Teaching Assistants (ITAs) receiving TEAM instruction make greater gains in oral proficiency.

2.1 ITAs receiving TEAM Instruction showed higher post test scores than other ITAs receiving an oral proficiency approach.

2.2 ITAs receiving TEAM instruction took less time to make improvements than other ITAs receiving an oral proficiency approach.

3.0 International Teaching Assistants (ITAs) receiving TEAM instruction better long term retention of gains in oral proficiency.

3.1 ITAs receiving TEAM instruction had higher retention of gains in oral proficiency when retested 3 and 6 months after instruction.

3.2 ITAs receiving other forms of oral proficiency instruction lost gains (regressed to preinstruction levels of performance) when retested 3 and 6 months after instruction.

Conclusions

The activities of the TEAM project warrant the conclusion that this project was successfully completed. This conclusion is drawn based on the following verifiable events:

1. The classroom performance of students enrolled in classes and labs taught by ITAs who had received TEAM instruction was better than that of students taught by other groups of ITAs.

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3.2 ITAs receiving other forms of oral proficiency instruction lost gains (regressed to preinstruction levels of performance) when retested 3 and 6 months after instruction..

Conclusions

The activities of the TEAM project warrant the conclusion that this project was successfully completed. This conclusion is drawn based on the following verifiable events:

1. The classroom performance of students enrolled in classes and labs taught by ITAs who had received TEAM instruction was better than that of students taught by other groups of ITAs.

2. The TEAM Project developed an instructional strategy that produced significant and long lasting improvements in the oral proficiency of teaching assistants who received this approach to accent modification.

3. The TEAM Project developed, tested, and successfully debugged software to produce a multimedia program (not a prototype) that runs reliably and dependably on personal computers found at colleges and universities.

4. The TEAM Project dissemination activities resulted providing complimentary copies of the TEAM software to a critical mass of 200 institutions with high enrollments of international teaching assistants

Appendix A
Population Demographics

Analysis of Characteristics of Teaching Assistants

	AM-TA		EX--ITA		TEAM-ITA		OP-ITA		TOTAL	
	#	%	#	%	#	%	#	%	#	%
AGE										
21 - 25	16	50.00	8	25.00	5	15.62	4	12.50	33	25.78
26 - 30	10	31.25	13	40.60	15	46.87	16	50.00	54	42.18
31 - 35	5	15.62	9	28.12	9	28.12	10	31.25	33	25.78
36 - 40	1	3.12	2	6.25	3	9.37	2	6.25	8	6.25
GENDER										
Female	13	40.62	20	62.50	15	15.62	18	56.25	56	43.75
Male	19	59.37	12	37.50	17	53.12	14	43.75	72	56.25
NATIONALITY										
India	0	0	4	12.50	5	15.62	4	12.50	13	10.15
Indonesia	0	0	1	3.12	0	0	0	0	1	0.70
Japan	0	0	0	0	1	3.12	2	6.25	3	2.30
Peoples Republic of China	0	0	18	15.62	15	46.87	21	65.62	54	42.18
Russia	0	0	3	9.37	2	6.25	0	0	5	3.90
Taiwan	0	0	6	18.75	8	25.00	5	15.62	19	14.84
Other	0	0	0	0	1	3.12	0	0	1	0.70
United States of America	32	100	0	0		0	0	0	32	25.00

Analysis of Characteristics of Teaching Assistants

	AM-TA		EX-TA		TEAM-ITA		OP-ITA		TOTAL	
	#	%	#	%	#	%	#	%	#	%
MAJOR										
Biology	4	12.50	6	18.75	5	15.62	4	12.50	19	14.84
Business Administration	11	34.37	10	31.25	8	25.00	9	28.12	38	29.68
Chemistry	3	9.37	5	15.62	7	21.87	6	18.75	21	16.40
Computer Science	7	21.87	3	9.37	6	18.75	4	12.50	20	16.40
Engineering	3	9.37	7	21.87	4	12.50	5	15.62	19	14.84
Mathematics/Physics	3	9.37	1	3.12	0	0	2	6.25	6	4.68
Other	1	3.12	0	0.00	2	6.25	2	6.25	5	3.90
YEARS IN UNITED STATES										
Less than 1 Year	0	0	4	12.50	17	53.12	16	50.00	37	28.90
1 Yr - 2 Yrs	0	0	13	40.62	10	32.15	8	25.00	31	24.12
2 Yrs - 3 Yrs	0	0	10	31.25	3	9.37	5	15.62	18	13.63
More than 3 Years	32	100	5	15.62	2	6.25	3	9.37	42	32.81
YEARS *SPEAKING* ENGLISH										
Less than 1 Year	0	0	2	6.25	14	43.75	18	56.25	34	26.56
1 Yr - 2 Yrs	0	0	9	28.12	13	40.62	10	31.25	32	25.00
2 Yrs - 3 Yrs	0	0	15	46.87	2	6.25	4	12.50	21	16.40
More than 3 Years	32	100	6	18.75	3	9.37	0	00.00	41	32.03

Analysis of Characteristics of Teaching Assistants

	AM-TA		EX-TA		TEAM-ITA		OP-ITA		TOTAL	
	#	%	#	%	#	%	#	%	#	%
TOEFL Score										
525 - 550	NA		3	9.37	10	31.25	8	25.00	21	21.87
551 - 575	NA		9	28.12	16	50.00	15	46.87	40	41.66
576 - 600	NA		12	37.50	4	12.50	6	18.75	22	22.91
601 - 625	NA		5	15.62	1	3.12	2	6.25	8	8.33
Above 625	NA		3	9.37	1	3.12	1	3.12	5	5.20
SPEAK Score (Base)										
Below 230	0		0	0	32	100	32	100	64	50.00
230 - 245	0		15	46.87	0	0	0	0	15	11.71
246 - 260	0		11	34.37	0	0	0	0	11	8.59
Above 261	32		6	18.75	0	0	0	0	38	29.68
SPEAK Score (Retest1)										
Below 230	0	0	0	0	2	6.25	6	18.75	8	6.25
230 - 245	0	0	15	46.87	29	90.62	24	75.00	68	53.12
246 - 260	0	0	13	40.62	1	3.12	2	6.25	16	12.50
Above 261	32	100	4	12.50	0	0	0	0	36	28.12

Appendix B
Teaching Ratings

Ratings of Teaching Assistant Speech Patterns

Question	American TA n=328	Exempt ITA n=314	OP/ARTIC ITA n = 333	TEAM ITA n =326
1. What grade do you expect to receive in this course.	:::::::::::::::	:::::::::::::::	:::::::::::::::	:::::::::::::::
a. A.	132 *(40.24%)*	73 *(23.24%)*	56 *(16.81%)*	61 *(18.71%)*
b. B.	135 *(41.15%)*	145 *(46.17%)*	120 *(36.03%)*	137 *(42.08%)*
c. C.	61 *(18.59%)*	84 *(26.75%)*	120 *(36.03%)*	117 *(35.88%)*
d. D.	0 *(0%)*	12 *(3.82%)*	32 *(9.60%)*	9 *(2.70%)*
e. E.	0 *(0%)*	0 *(0%)*	5 *(1.50%)*	2 *(.60%)*
::::::::::::::

Question	American TA n=328	Exempt ITA n=314	OP/ARTIC ITA n = 333	TEAM ITA n =326
5. ***My instructor PRONOUNCES:***				
a. A large number of consonants differently from American English.	0 (0%)	28 (8.91%)	213 (63.96%)	139 (42.63
b. A small number of consonants differently from American English.	4 (1.21%)	36 (46.17%)	90 (36.03%)	170 (42.08%)
c. Does not pronounce consonants differently from American English.	308 (93.90%)	241 (26.75%)	0 (0%)	0 (0%)
d. None of the above.	5 (1.52%)	6 (1.91%)	17 (5.10%)	11 (3.37%)
e. No Response	11 (3.35%)	3 (0.95%)	13 (3.90%)	6 (1.84%)
6. ***The RHYTHM AND MELODY of my instructor's speech is:***				
a. Different enough to interfere with communication.	0 (0%)	18 (57.32%)	79 (23.72%)	39 (11.96%)
b. Not different enough to interfere with communication.	19 (5.79%)	282 (89.80%)	211 (63.36%)	273 (83.74%)
c. Characteristic of American English speech patterns.	296 (90.25%)	2 (00.63%)	0 (00.00%)	3 (00.93%)
d. None of the above.	5 (1.52%)	2 (0.63%)	25 (7.50%)	5 (1.53%)
e No response	8 (2.43%)	5 (1.59%)	16 (4.80%)	6 (1.84%)
7. ***What percent of your instructor's speech do you understand?***				
a. More than 95%.	318 (96.95%)	279 (88.85%)	99 (29.72%)	184 (56.44%)
b. Between 85 and 95%.	3 (00.91%)	25 (7.96%)	146 (43.84%)	104 (31.90%)
c. Between 75 and 85%.	0 (00.00%)	0 (00.00%)	54 (16.21%)	20 (6.13%)
d. Less than 75%.	0 (00.00%)	0 (00.00%)	10 (3.00%)	3 (0.92%)
e None of the above.	2 (00.60%)	7 (2.22%)	18 (5.40%)	6 (1.84%)
e. No response.	5 (1.52%)	3 (0.94%)	6 (1.80%)	9 (2.76%)
8. ***The RHYTHM AND MELODY of my instructor's speech is:***				
a. Smooth and understandable.	315 (96.03%)	266 (84.71%)	26 (7.80%)	221 (67.79%)
b. Smooth but not understandable..	0 (00.00%)	6 (1.91%)	86 (25.12%)	10 (3.06%)
c. Choppy but understandable.	0 (00.00%)	27 (8.59%)	136 (40.80%)	71 (21.77%)

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Question	American TA n=328	Exempt ITA n=314	OP/ARTIC ITA n = 333	TEAM ITA n =326
d. Choppy and not understandable.	0 (00.00%)	3 (00.92%)	48 (14.41%)	3 (00.92%)
e. None of the above.	3 (00.91%)	9 (2.86%)	18 (5.40%)	15 (4.60%)
f. No response.	10 (3.04%)	3 (0.94%)	19 (5.70%)	6 (1.84%)
9. My instructor's speech is:				
a. Clear and understandable.	323 (98.47%)	262 (83.43%)	203 (60.9%)	256 (67.79%)
b. Clear but <u>not</u> understandable.	0 (00.00%)	0 (00.00%)	6 (1.80%)	6 (1.84%)
c. Unclear but understandable.	0 (00.00%)	40 (12.73%)	63 (18.91%)	22 (6.74%)
d Unclear <u>and not</u> understandable.	0 (00.00%)	0 (00.00%)	29 (8.70%)	3 (0.92%)
e. None of the above.	3 (0.91%)	4 (1.27%)	11 (3.30%)	21 (6.44%)
f. No Response.	2 (6.00%)	8 (2.54%)	21 (6.30%)	18 (5.52%)
10. My instructor's <u>TEACHING EFFECTIVENESS</u>:				
a. Is adversely affected by his/her speech.	0 (00.00%)	56 (17.83%)	137 (41.14%)	72 (38.95%)
b. Is not affected by her/his speech.	299 (91.15%)	251 (79.93%)	165 (49.54%)	231 (70.85%)
c. Is positively affected by his/her speech.	12 (3.69%)	0 (00.00%)	0 (00.00%)	0 (00.00%)
d. None of the above.	7 (2.13%)	5 (1.59%)	15 (4.50%)	13 (3.98%)
e No response	8 (2.43%)	2 (0.63%)	16 (4.80%)	10 (3.06%)
11. Pronunciation of speech sounds affects my instructor's <u>teaching effectiveness</u>:				
a. Negatively.	3 (0.91%)	35 (11.14%)	189 (56.89%)	127 (38.95%)
b. Not at all.	213 (64.93%)	263 (83.75%)	108 (32.43%)	156 (47.85%)
c. Positively.	99 (30.18%)	0 (00.00%)	0 (00.00%)	0 (00.00%)
d. None of the above.	5 (1.52%)	11 (3.50%)	16 (4.80%)	16 (4.90%)
e. No response.	8 (2.43%)	5 (1.59%)	30 (9.00%)	27 (8.28%)

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Question	American TA n=328	Exempt ITA n=314	OP/ARTIC ITA n = 333	TEAM ITA n =326
12. ***Melody and rhythm of speech affects my instructor's <u>TEACHING EFFECTIVENESS:</u>***				
a. Negatively.	**0** *(00.00%)*	**38** *(12.10%)*	**213** *(63.96%)*	**94** *(28.84%)*
b. Not at all.	**319** *(97.25%)*	**254** *(80.89%)*	**76** *(22.82%)*	**179** *(54.90%)*
c. Positively.	**5** *(1.52%)*	**0** *(00.00%)*	**0** *(00.00%)*	**0** *(00.00%)*
d. None of the above.	**0** *(00.00%)*	**7** *(2.22%)*	**37** *(11.11%)*	**24** *(7.36%)*
e. No Response.	**4** *(1.21%)*	**15** *(4.77%)*	**10** *(3.00%)*	**29** *(8.89%)*
13. ***My instructor <u>PRONOUNCES:</u>***				
a. A large number of vowel sounds differently from American English.	**0** *(00.00%)*	**97** *(30.89%)*	**113** *(33.93%)*	**55** *(16.87%)*
b. A small number of vowel sounds differently from American English.	**0** *(00.00%)*	**148** *(47.13%)*	**209** *(62.76%)*	**231** *(70.85%)*
c. Does not pronounce vowel sounds differently from American English.	**317** *(96.64%)*	**44** *(14.01%)*	**0** *(00.00%)*	**0** *(00.00%)*
d. None of the above.	**3** *(0.91%)*	**10** *(3.18%)*	**8** *(2.40%)*	**16** *(4.80%)*
e No response	**6** *(1.82%)*	**15** *(4.77%)*	**3** *(0.91%)*	**24** *(7.36%)*
14. ***MY OWN classroom performance has:***				
a. Not been affected by my instructor's speech patterns.	**264** *(80.48%)*	**286** *(91.08%)*	**243** *(72.97%)*	**283** *(86.60%)*
b. Has been positively affected by my instructor's speech patterns.	**0** *(00.00%)*	**0** *(00.00%)*	**0** *(00.00%)*	**0** *(00.00%)*
c. Has been negatively affected by my instructor's speech patterns	**16** (4.87%)	**25** (79.61%)	**85** (25.55%)	**32** *(9.81%)*
d None of the above.	**32** *(9.75%)*	**0** *(00.00%)*	**0** *(00.00%)*	**8** *(2.45%)*
e. No response.	**16** *(4.87%)*	**3** *(0.95%)*	**5** *(1.50%)*	**4** *(1.22%)*
15. ***During this class, my instructor's speech has:***				
a. Not Changed.	**306** *(93.29%)*	**266** *(84.71%)*	**116** *(34.83%)*	**78** *(23.92%)*
b. Gotten easier to understand.	**5** *(1.52%)*	**38** *(12.10%)*	**151** *(45.34%)*	**215** *(65.95%)*
c. Gotten more difficult to understand.	**0** *(00.00%)*	**4** *(12.73%)*	**30** *(9.00%)*	**7** *(2.14%)*
d. None of the above.	**8** *(2.43%)*	**2** *(0.63%)*	**15** *(4.50%)*	**14** *(4.29%)*

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Question	American TA n=328	Exempt ITA n=314	OP/ARTIC ITA n = 333	TEAM ITA n =326
e. No response.	7 (2.13%)	4 (1.27%)	21 (6.30%)	12 (3.68%)
16. My instructor's speech has changed because I have become more familiar with her/his speaking patterns.				
a. True.	6 (1.82%)	282 (89.80%)	137 (41.17%)	169 (51.84%)
b. False.	0 (00.00%)	0 (00.00%)	189 (56.75%)	133 (40.79%)
c. None of the above.	311 (94.81%)	19 (6.05%)	0 (00.00%)	13 (3.98%)
d. No Response.	10 (3.04%)	13 (4.14%)	7 (2.10%)	11 (3.37%)
17. When students do not understand what the instructor is saying he/she:				
a. Repeats herself/himself.	3 (0.81%)	9 (2.86%)	20 (6.00%)	130 (39.87%)
b. Writes on the board.	9 (2.74%)	15 (4.77%)	64 (19.21%)	82 (25.15%)
c. Doesn't do anything.	16 (4.87%)	15 (4.77%)	83 (24.92%)	16 (4.90%)
d. None of the above.	295 (89.97%)	254 (86.89%)	120 (36.03%)	81 (24.84%)
e. No response.	5 (1.52%)	21 (6.68%)	46 (13.81%)	13 (39.87%)
18. Which of the following best describes the* AMOUNT OF EFFORT *you have to make to understand your instructor's speech?				
a. Little or no effort to understand.	278 (84.75%)	251 (79.93%)	166 (49.84%)	245 (75.15%)
b. Minimal effort to understand.	19 (5.79%)	31 (9.87%)	99 (29.72%)	46 (14.11%)
c. Considerable effort to understand.	0 (00.00%)	16 (5.09%)	44 (13.21%)	6 (1.84%)
d. None of the above.	3 (0.91%)	6 (1.91%)	13 (3.90%)	10 (3.06%)
e. No response.	6 (1.82%)	10 (3.18%)	11 (3.33%)	19 (5.82%)
19. My instructor:				
a. Seems aware of his/her speech patterns.	39 (11.89%)	113 (35.98%)	237 (71.11%)	277 (84.96%)
b. Does not seem to be aware of her/his speech patterns.	91 (27.74%)	78 (24.84%)	42 (12.61%)	32 (9.81%)

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Question	American TA n=328	Exempt ITA n=314	OP/ARTIC ITA n = 333	TEAM ITA n =326
c. Neither of the above.	177 (53.96%)	112 (35.98%)	38 (11.41%)	0 (00.00%)
d. No Response	21 (6.40%)	11 (3.50%)	16 (4.80%)	17 (5.21%)
20. My instructor				
a. Seems to make an effort to make her/his speech more understandable.	39 (11.89%)	213 (67.83%)	266 (79.87%)	295 (90.49%)
b. Does not make an effort to make his/her speech understandable.	3 (0.91%)	73 (23.24%)	49 (14.71%)	16 (4.90%)
c. Neither of the above	272 (83.95%)	22 (7.00%)	5 (1.5%)	6 (1.84%)
d No response	14 (4.26%)	6 (1.91%)	13 (3.90%)	9 (2.76%)

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Appendix C
Honors and Awards

CONGRATULATIONS

TESOL member wins national award for accent software

Arthur H. Schwartz, Professor of Speech and Hearing at Cleveland State University, is the recipient of the 1995 Excellence in Teaching English Award from the English Speaking Union (E-SU) of the US for his development of multimedia software enabling international teaching assistants and faculty to modify their accents. The TEAM (Technology Enhanced Accent Modification) Project directed by Schwartz was funded by the Fund for Improvement of Postsecondary Education (FIPSE) with the idea that it could have a pervasive impact on undergraduate and graduate education. Schwartz's approach uses audiovisual feedback to teach students to recognize and modify key components of an accent. More than 1,800 model utterances containing different accent features have been recorded and digitized on the program's CD. Students see and hear examples of a model utterance and can then record their own attempts to match those features.

Arthur H. Schwartz (right) shows Xiong Chen, an international teaching assistant, how to evaluate graphic displays of accent.

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The English-Speaking Union of the U.S.

presents the 1995

Excellence in English Award

to

The TEAM Project

at Cleveland State University

for outstanding contributions to the teaching of English in America.

David Olyphant, Executive Director

Cleveland Branch
THE ENGLISH-SPEAKING UNION
OF THE UNITED STATES

Awards This Certificate To:

TECHNOLOGY ENHANCED ACCENT MODIFICATION
CLEVELAND STATE UNIVERSITY
1995 CLEVELAND NOMINEE

For: English as a Second Language category

Excellence-in-English
in the
E-SU National Competition

Branch President

Excellence-in-English Coordinator

Appendix D
Publicity

Technology Increases Effectiveness of *Accent Modification*

By Arthur H. Schwartz, PhD, CCC-SLP
Special to ADVANCE

There have been a number of advances in technology that offer exciting opportunities for speech-language pathologists to increase our effectiveness in accent modification.

With newer technologies it is possible for our clients to see as well as hear their speech, compare their utterances to models, and develop an understanding of what they need to do to modify their accents. Combined with the techniques we have used successfully for modifying segmental features, technologies enhance the modification of suprasegmental features of an accent, such as intonation, phrasing, syllable stress, and even consistent production of word endings.

With the aid of a simple mirror, a low-tech device, clients can see as well as hear their production. The addition of the visual modality enhances a client's ability to recognize, approximate, and evaluate their speech.

Historically, other low-tech devices, such as tape recorders and the Language Master, have been used to modify accents.

It can be cumbersome and time-consuming to rewind a tape to the exact spot needed to replay an utterance for a client. Often, when replaying segments, clients cannot accurately evaluate whether they are producing the feature appropriately.

I have often thought that, after three or four replays of a segment, clients who say, "Yes, I hear it now," still do not hear it. Rather, they are saying this more to please their clinician.

Sue Fenn Chen, one of my clients, highlighted this succinctly when she told me, "It's like listening to myself singing in the shower. I think it sounds great, but everybody else doesn't."

Modifying suprasegmentals is more difficult and time-consuming than efforts to improve consonant and vowel production. Why? Probably because the auditory modality alone is not enough to provide clients with the clues they need to change prosody.

Sound is temporally fleeting, memory is often faulty, and half the time clients have difficulty understanding what we mean by intonation, stress and timing.

In their introductory textbook on *General American Phonetics* (New York: Harper & Row, 1979) Van Riper and Smith stated, "Research has shown that sentences spoken with appropriate junctures are four times more easily understood than those with inappropriate ones" (pp. 145-146).

For Asian speakers, the third fastest-growing immigrant population, it is a major challenge to modify suprasegmental features such as juncture. Does this mean clients can make greater improvements if they modify the suprasegmental features?

Arthur H. Schwartz, PhD, CCC-SLP

Prosodic features are basically changes in the frequency and intensity as a function of time. Extracting the acoustic properties of sound is something that technologies do accurately, quickly and reliably.

Displaying such properties is also something computers do well.

However, until recently, such technologies have been expensive, complicated to learn and use, and limited in other clinical applications. As a consequence, only limited efforts—mostly reported in the English as a second language literature—have been reported about the use of technology for modifying prosody.

General and dedicated are the two kinds of technology used in accent modification.

General technologies are typically hardware devices that do a number of functions, including analysis and display of segmental and/or suprasegmental features.

Often using high-quality sound boards for doing acoustic analyses, general technologies can be somewhat costly. Versions are available to operate on low-cost personal computers that can be used for other clinical and administrative purposes.

Manufacturers have incorporated a number of operating features to make the devices adaptable for different applications. Consequently, some of the general technologies can be a bit time-consuming to learn and a bit awkward to use. Among some of the most familiar are SpeechViewer I or II, from The Psychological Corp., San Antonio, Texas; VisiPitch, from Kay Elemetrics Corp., Lincoln Park, NJ; and Video Voice Speech Training System, from Micro Video Corp., Ann Arbor, MI.

Dedicated technologies, on the other hand, are usually software programs that have been specifically designed for accent modification. The acoustic analyses done by the sound boards used by dedicated technologies may be suitable for intervention purposes but certainly are not of the laboratory quality found in the general technologies.

Operating on the most common types of personal computers that can be found in most organizations, there are several multimedia, or quasi-multimedia, programs that are available. Typically one-fourth to one-fifth of the cost of general devices, dedicated technologies use a graphic user interface (icons) that make them easier to learn and easier to use.

Among some of the newest dedicated technologies for accent modification are Master Pronunciation, by Cali, American Fork, Utah; Rosetta Stone, by Fairfield Language Technologies, Harrisonburg, VA; Speech Works, by Trinity Software, Campton, NH; and the TEAM (Technology Enhanced Accent Modification) program developed at Cleveland State University, Cleveland, Ohio, and distributed by Tiger Electronics, Seattle, WA.

There are a number of reasons why both general and dedicated technology enhances accent modification.

Many, although not all, are multisensory rather than unisensory. That is, some kind of graphic image, in addition to the audio recording, is displayed for the client to see and analyze.

Using either a horizontal line depicting pitch changes over time or amplitude displays, clients can see what intonation, phrasing, syllable stress and juncture actually look like and hear their approximation.

Secondly, technologies are client-centered rather than clinician-centered. Often in traditional accent modification, our clients tend to rely on us to judge whether their utterance was acceptable.

Arthur H. Schwartz, PhD, (at right) shows Chen Xiong how to evaluate the graphic displays of accent features. *(photo/courtesy Cleveland State University)*

With technologies that display utterances, clients are able to see/hear the pitch line rise or fall to indicate the intonational marker at the end of the utterance; see/hear the increased loudness and duration characterizing syllable stress; and see/hear word endings that often are omitted by speakers.

Because they can see what they are doing, clients are better able to assume the responsibility for monitoring their own speech rather than relying on their clinician.

A third reason is that technological displays are objective rather than subjective. We are all familiar with the "Yes I did, no you didn't" dialogue when listening to a replay of an audiotape and trying to convince a client that he or she didn't quite demonstrate the accuracy of production that was intended.

Graphic displays enable clients to see the similarities or discrepancies between their utterances and a model.

Client/clinician dialogues can then focus on what needs to be done to match the model.

I believe that the more the client sees, the more he or she understands what needs to be done.

The more the client understands what needs to be done, the more active role he or she can take in monitoring his or her own speech and getting carryover outside the clinical setting.

Lastly, technologies are more engaging. Admittedly, some aspects of accent modification can be dull and monotonous. Learning and reading graphic displays foster a high level of attending. Clients are highly involved and seldom tune out as with other drill and practice approaches.

While effectiveness, rather than engagement, is the critical feature of effective accent modification, how can we be effective if we can't get or hold the client's attention? In the hands of a good clinician, the drill and practice format can be a context for dialogues and interactions that provide opportunities for functional communication.

I believe technologies require a clinician or instructor. At this point they are limited for self-instruction. Clients need the interaction with a clinician, as they are developing the skills to monitor and modify their accents.

A number of traditional approaches have been effective in training clients to modify their accents. However, technology empowers clients by showing them how to assume control for monitoring their own speech, a skill that is absolutely essential for maintaining gains outside the clinic.

Recently, I asked one of my clients, a neurologist from Korea, what was the most significant thing he had gained from the technology-based approach I had used to teach him to modify his accent. Without hesitation, he replied, "I no longer have to apologize to new patients for my poor speech."

Clearly, technology directly impacted on the features of his accent. However, his comment reminded me that we need to remember that indirect benefits, such as increased self-confidence and self-esteem, are equally or more important for long-term change.

• *About the author: Dr. Schwartz is a professor of speech-language pathology at Cleveland State University and a fellow of the American Speech-Language-Hearing Association. He can be contacted at* A.Schwartz@CSUOHIO.EDU *via e-mail.*

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Program at CSU helps immigrants speak clearer English

America was built on accents.

Immigrants came from all over the world and most of them did not speak English. If they did, they were sure to have an accent.

If they learned English before coming to this country, they often picked up the accent of their language teachers overseas.

Unfortunately, an accent can handicap a job search. It can endanger a university career, because graduate students and others with accents that students find hard to follow might not be permitted to teach.

Arthur H. Schwartz, a speech and hearing professor at Cleveland State University, is working on the problem.

He has devised a computer program that helps people eliminate or soften their accents, making them easier to understand and more employable.

Virginia Brogan, a CSU tutor, was an assistant for the three-year research project that concluded last October.

Here is how Schwartz's program works. Clients, most of whom are CSU students, sit before a computer screen and read a statement while viewing a display of their speech patterns on the screen.

NEW WORLDS

William F. Miller

At the same time, a display of speech patterns from someone speaking proper English is on the screen. The students try to modify their speech patterns to fit the correct model.

"The students see the speech represented in symbols on the screen, and then the tutor who sits next to the student reinforces the words for the students," Schwartz said.

He said the exercises also strive to eliminate unwanted habits such as talking in a monotone, choppy speech, inappropriate syllable stress or omission of sounds. The program makes it easier for international students to understand how to modify their accents.

Schwartz received the 1995 Excellence in Teaching as a Second Language award from the English Speaking Union.

He also is seeking a publisher to market his system.

Wai Ming Poon, 23, from Hong Kong, was working with the computer program and Brogan.

Poon, a student at CSU in speech and hearing, said that she has worked with the program for 16 hours and that she is making progress.

Arthur H. Schwartz, a speech and hearing professor at Cleveland State University, standing, discusses his computer program with Yiong Chen. Schwartz's program uses comparative displays of speech patterns to help people eliminate or soften their accents.

Poon's English is excellent, but she is working on her accent. She has trouble pronouncing certain English words.

She has studied English since she was 6. Hong Kong has been a British colony for many years. She wants to help others with speech and hearing problems.

"In general, American listeners have minimal difficulty understanding European speakers because the prosody [stress, intonation and melody] of their native language is similar to American language," said Schwartz.

"Although the number of consonants and vowel differences are no greater than those in European language, Indian, Middle-Eastern and Asian speakers have more difficulty being understood."

Again, it is stress, intonation and melody that causes the problem for Asians.

He said the best way to deal with an accent is to modify its most distracting and disruptive features.

Schwartz's study, called the Team Project, is supported by a grant from the United States Department of Education.

It is also designed to help international teaching assistants and faculty members be more easily understood.

Schwartz said there are thousands of international students and immigrants in college who can benefit from his system.

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Cleveland State University

SUMMER 1996

Perspective

Arthur H. Schwartz, professor of speech and hearing, and his Technology Enhanced Accent Modification (TEAM) project received the 1995 Excellence in Teaching English As a Second Language Award from the English Speaking Union (ESU) of the United States.

This national distinction follows recognition of Dr. Schwartz and TEAM for "Excellence in English" by the Cleveland branch of the ESU last June.

In the national competition, programs were evaluated for their innovation, measurable effectiveness, and overall value. The TEAM project was rated superior in all categories.

Realizing accented English to be a problem for many of the 15 million students enrolled in over 3,500 colleges and universities nationwide, Dr. Schwartz took on the task of finding the best solution with the least amount of disruption to students and teachers. His goal was to find an educationally sound and economically feasible approach to teaching American English in institutions which rely on International Teaching Assistants (ITAs) to teach undergraduate classes.

Beginning in 1993 with a grant from the U.S. Department of Education Fund for Improvement of Postsecondary Education (FIPSE), Dr. Schwartz initiated the TEAM Project, a three-year program designed to disseminate multimedia software that combines both visual and auditory feedback to enhance accent modification instruction for ITAs and faculty members.

The TEAM approach to accent modification uses software to provide graphic displays of speech patterns, enabling users to see, as well as hear, what they are saying.

"Being able to see features such as monotone, choppy speech, inappropriate syllable stress, or omission of sounds makes it easier for international students to understand what to do to modify their accents," says Dr. Schwartz.

Over the past three years, 72 international students enrolled at Cleveland State have received accent modification instruction and improved the understandability of their speech through the TEAM project.

But the ultimate beneficiaries, notes Dr. Schwartz, are the students enrolled in classes and labs taught by TEAM-trained faculty and assistants.

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CLEVELAND STATE UNIVERSITY

Technology Enhanced Accent Modification for International Teaching Assistants

Purpose of Project:

TEAM is an acronym for "technology enhanced accent modification". The TEAM Project was initiated to address complaints from students, enrolled in colleges and universities that their performance was adversely influenced by the nearly incomprehensible accents of their international teaching assistants (ITAs). We sought to develop multimedia software that operates on common personal computers, thereby making accent modification instruction more accessible at U.S. colleges and universities

Innovative Features

The program developed by the TEAM project consists of six components: (1) software that enables the user to retrieve, display, and play model utterances of speech features; (2) a 37 item computer based Accent Survey that assists in identifying features of accent that need to be modified; (3) a curriculum that addresses the 15 features of speech that make accents most difficult to understand; (4) an instructional methodology designed to teach the international teaching assist how to assume control for monitoring as well as modifying his/her accent; (5) a database of 3600 (1800 male and 1800 female) model utterances containing accent features the ITA is modifying; and (6) a reference manual describing the operation of the program. Extensive on-line assistance is provided to assist users in answering questions about program operation and instructional techniques.

The TEAM Project has six characteristics that differentiate it from other approaches to accent modification. It: (1) addresses the **prosodic** (pitch, loudness, timing) features of accent as well as pronunciation of consonants and vowels; (2) provides **multisensory instruction and feedback** by using technology to enable ITAs to see as well as hear their speech; (3) contains a **built-in curriculum** that addresses the 15 features, or topics, of speech that will make an accent more understandable; (4) is designed to be used by **tutors** (preprofessional or graduate students), thereby lowering delivery costs; (5) employs **tactics** designed to teach the ITA how to assume responsibility for maintaining the improvements he or she learns; and (6) it utilizes off-the-shelf **personal computers** that are widely available and affordable to colleges and universities.

Evaluation:

The specific objectives of the project have been to (1) develop reliable accent modification software that would operate on computers found at most higher education institutions; (2) to determine how TEAM based accent modification instruction impacted on the performance of students taught by ITAs; and (3) to disseminate the software to the institutions with the largest numbers of ITAs.

The project was field tested at Cleveland State University, Kent State University, and the University of Toledo. Project staff trained, and supervised tutors at both sites. Tutors were trained to follow the design protocol and to adhere to the TEAM instructional tactics. At each

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institution, data were gathered on both the performance of students taught by teaching assistants as well as the oral proficiency of the teaching assistants themselves. A repeated measures mixed design was used to evaluate: (1) type of teaching assistant; (2) student performance and (3) teaching assistant oral proficiency performance before and at several intervals following instruction.

Analysis of field test results indicates the following:

1.0 Students enrolled in classes taught by International Teaching Assistants receiving the TEAM instruction perform better than students enrolled in classes taught by ITAs who have had other forms of accent modification.

2.0 International Teaching Assistants (ITAs) receiving TEAM instruction perform better in the classroom than ITAs receiving other forms of oral proficiency instruction.

3.0 International Teaching Assistants (ITAs) receiving TEAM instruction make greater gains in oral proficiency.

4.0 International Teaching Assistants (ITAs) receiving TEAM instruction better long term retention of gains in oral proficiency.

Impact or Changes From Grant Activities:

Complimentary copies of the TEAM software were distributed to over 200 universities with the largest enrollments of international students. No information is available to indicate how many of them will be using the program as part of their ITA training programs. In addition to the field test sites, the software has been adopted for use at the University of Memphis, Michigan State University and the University of Wisconsin. We would like to be optimistic that the approach will be implemented more extensively as data are published on the effectiveness of the project.

What Activities Didn't Work?

The major activity that didn't work was using an off-the-shelf authoring Program (Asymmetrix Toolbook) for extracting and displaying sound patterns. Nearly nine months were wasted trying to extract pitch and display a pitch contour only to have the company admit that the software could not perform those functions. After switching to a more powerful programming language (Borland C++) we were able to accomplish this task.

There were a number of activities that worked but *didn't work well* that could be of interest to other FIPSE project directors. A number of institutions do not retest ITAs for oral proficiency after remedial coursework has been completed. It took considerable time, effort, and cajoling to get institutions to follow up. In addition, considerable "passive resistance" was encountered from English as a Second Language Departments to using and following the protocol. Third, at least half of the institutions that were to participate as test sites had to be dropped because they would not comply with the protocol.

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What Do You Have to Send Others and How Do They Get It?

A TEAM DEMO disk is available to institutions interested in considering the software for adoption in their ITA training program. The final report of the project is available on disk. The report is written in Word 7.0 And can be printed on any PC system that uses Windows 3.xx or Windows 95. The TEAM software is commercially available at substantial educational discount for institutions of higher education. For information on obtaining any of the above, send an e-mail to:

A.Schwartz@csuohio.edu

Cost Efficiencies:

It costs approximately $335.00 to deliver instruction to a student with the Oral Proficiency Approach. It costs $264.00 to deliver instruction to a student using the TEAM Approach. TEAM costs 22% less to deliver. When long term retention of gains in oral proficiency as well as student outcomes for the two approaches are factored in, it is estimated that the TEAM Approach is *50% less expensive* to provide.

What Has Happened to the Program Since the Grant Ended?

Not as much as anticipated. Demand for the TEAM, at least at Cleveland State, is high because of word of mouth from ITA to ITA. Due to budgetary and administrative problems, TEAM is being continued only on a limited basis. Other institutions seem To be having better success. On the basis of correspondence with other institutions, it seems that decisions to deal with the oral proficiency problem of ITAs are based more on political and territorial factors in an institution rather than empirical evidence of instructional efficacy or economic advantage. Regrettably, it seems that although there aren't sufficient resources at many institutions to adopt TEAM, there are adequate funds to keep doing things the way they have been doing them in the past.

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